

Physics Honors 2008/2009

Instructor: Mr. Joslin
E-mail: jjoslin@newhampton.org
Dorm: Galletly
Phone: (603)677-3968
Class website: to be determined

Course Summary

Physics Honors is a college preparatory course designed to connect students with the underlying principles of the natural phenomena they experience every day. Throughout the fall semester, students will build a strong foundation in the study of physics with an in-depth look at mechanics, which includes the topics of motion, vectors, forces, work, energy, and momentum. In the spring, students will use this base to explore more advanced and varied topics such as thermodynamics, sound, light, electricity, magnetism, and atomic physics. This is a Level III class recommended for juniors and seniors that have a **thorough** understanding of algebra.

Class Meeting Time

E Block/
Meservey 106

Extra Help: By
Appointment

Course Materials

Text: *Holt Physics* (3rd Edition)
by Raymond A. Serway and Jerry S. Faughn
(ISBN: 0030735483)

Calculator: Standard scientific calculator or
TI-83 graphing calculator
NO CELL PHONES!

Notebook: 3-ring binder with 6 sections:
1) Journal 2) Notes 3) Handouts 4) Labs
5) Homework 6) Quizzes & Tests

* These materials and a #2 pencil should be brought to class every day.

Course Objectives

Writing - Learn to present credible data with scientific writing through lab reports and properly documented research papers.

Reading - Learn to recognize priority material through skim reading of text to supplement in-class discussions.

Problem Solving - Understand the underlying relationships between physical quantities and use dimensional analysis to build structure when solving a problem.

Technology - Learn new technology and computer applications through hands on experience.

Research - Learn how to ask an appropriate question and find multiple sources to support/refute a hypothesis.

Organization - Learn to balance commitments and plan for the long-term.

Note Taking - Learn to supplement notes with information from outside of the classroom.

Speaking - Learn to defend a hypothesis with a well-reasoned and coherent argument in front of peers.

Awareness - Gain a sense of how physics is relevant to our planet, our community, and our everyday lives.

Grading Procedures

Term grades are calculated using the following categories and percentages:

Category	Available Points	% Grade
Homework	5 or 10 pts. each	15%
Notebook/Journal	100 pts./10 pts. each	10%
Participation	100 pts.	10%
Quizzes/Labs	5 to 100 pts. each	25%
Tests	100 pts. each	20%
Final		20%



Homework

Homework will be given 3 to 4 times a week and is usually due the next class period. Homework must be completed by the **beginning** of class the day it is due.

Missed Homework

Missed homework due to excused absences must be turned in by the second class period following the absence. Missed homework due to an unexcused absence will be considered late.

Graded Homework

Graded homework will be graded as a quiz. All other homework will be graded using the following scale.



Journal

Students will keep a weekly journal as a section in their Notebook (3-ring binder). At the beginning of each long block, students will respond to a prompt given in various forms, i.e. a question, a problem, or an activity. The purpose of this exercise is to review pertinent information each week and to give students the opportunity to critically think and write about a relevant topic in physics without necessarily having to solve a mathematical problem.

Homework Evaluation

√+ 5 points

Homework is (1) complete, (2) passed in on time, (3) neat and legible, and (4) shows a comprehensive understanding of the applicable concepts.

√ 4 points

Homework is (1) complete, (2) passed in on time, (3) legible, and (4) shows a general understanding of the applicable concepts. Some of the answers may show confusion of the concepts.

√- 3 points

Homework is (1) incomplete, (2) passed in on time, (3) untidy, and/or (4) shows a lack of effort or failure to understand the applicable concepts. This is the highest grade homework may receive if it is handed in **one** school day late.

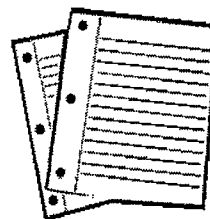
- 2 points

Homework is (1) incomplete, (2) passed in on time, (3) untidy, and/or (4) shows no effort or understanding of the applicable concepts. This is the highest grade homework may receive if it is handed in **two** school days late.

0 0 points

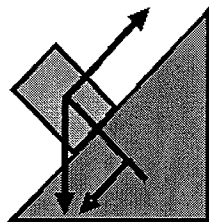
Homework is **three** or more school days late or doesn't meet any of the above criteria.

Course Structure



Notebook

All students are expected to keep a binder that includes and organizes all course materials. This provides a way to practice organizational skills that are critical in college and life. Notebooks may be checked on any day, but most frequently on test days. They will be evaluated based on (1) neatness, (2) organization, (3) completeness, (4) correct labeling, and (5) dating all material.



Labs

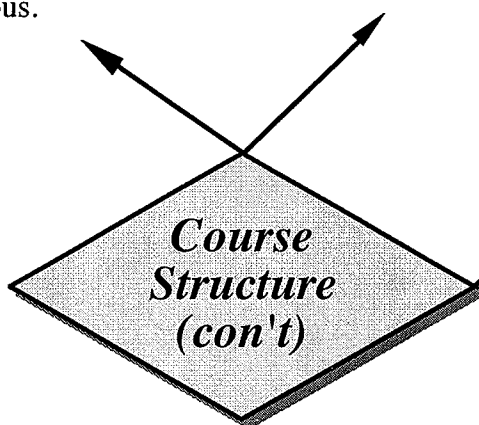
Weekly laboratory exercises will provide hands on experience with concepts covered in the course and will teach students the process of the scientific method. New technology and computer applications will also be used to study the principles of Physics. Formal laboratory reports will be an important component of these exercises and must follow the Lab Report Template accompanying this Syllabus.

Projects

Class projects will focus on breaking down everyday phenomenon into simplified components that can easily be described by the principles of physics. Research and presentation skills will be emphasized in these projects. No more than one project will be given a term, and project evaluations will be a component of the term Final.

Quizzes/Tests

Periodically students will be tested on their ability to retrieve material covered in the course. These evaluations can take many forms and will *usually* be announced but don't have to be. Tests will be given several times a term (usually when a chapter in the text is completed) and will always be announced.



Participation

It is expected that all students will be involved in class discussions in both formal (lectures) and informal (lab/ demonstration) settings. Weekly participation grades will be given to each student based on the following scale:

- 10 pts** engaged, focused, asks questions freely
- 8 pts** engaged, attentive, participates when called upon
- 6 pts** generally engaged, sometimes distracted, little input
- 4 pts** rarely engaged, easily distracted, little input
- 2 pts** disengaged, distracts others, no input

Class Policies

This class and all of its members will model learning through adherence to the core values of New Hampton School – Individual Transformation, Inclusivity, Diversity of Learners, Individuality, Academic Innovation, Respect and Responsibility. In this way, we hope to create an atmosphere in which learning is fun, productive, and comfortable.

Extra Help

If you are struggling, have questions, or need help, please come see me. It is important that we communicate with each other to make this year as productive as possible. I will be asking for frequent feedback from you on how I am doing. Please feel free to ask me if you need advice or feedback.

Attendance/Tardiness

Attendance is required at all class meetings. If your absence is not excused, you will receive a cut. Please be on time. If you are not present when class begins, you are tardy. If you are tardy **four** times you will receive a cut. You are responsible for obtaining work missed while you are away. This includes notes, handouts, and homework. Please notify me in advance if you will be missing class.

Fall 2008 Schedule

Class Information

September 8 – December 15

51 Class Periods

Final Evaluation:

E Block: December 18 @ 9:00 am

Unit 1: The Scientific Method

We will define the study of physics and develop a concrete understanding of the steps involved in the scientific method. Students will practice breaking problems into components, determining what to solve for, and building strategies for finding the solution.

Weeks 1-2: 6 days Ch. 1: The Science of Physics
Test Week 2

Unit 2: Motion and Forces

We will learn how to describe mechanical motion in one and two dimensions, how forces relate to motion through Newton's laws, and how to utilize the powerful analysis capabilities of vectors. Students will further develop problem solving skills and will begin to present and analyze data in different forms, including tables, graphs, and spreadsheets.

Weeks 2-4: 7 days Ch. 2: Motion in One Dimension
Test Week 4
Weeks 4-6: 9 days Ch. 3: Two-Dimensional Motion and Vectors
Test Week 6
Weeks 7-8: 9 days Ch. 4: Forces and the Laws of Motion
Test Week 8

Unit 3: Energy and Momentum

We will learn how to do work on and input energy into a system by applying forces, how to differentiate between the different types of energy, and how momentum is a conservative quantity (like energy and mass) in ideal collisions. Students will continue to develop their inductive and deductive reasoning skills with the aid of computers.

Weeks 8-10: 9 days Ch. 5: Work and Energy
Test Week 10
Weeks 10-12: 8 days Ch. 6: Momentum and Collisions
Test Week 12
Weeks 13-14: 3 days Catch Up, Review, and Project Presentations
Week 15: 1 day Final Exam

Spring 2009 Schedule

Class Information

January 6 – May 16

65 Class Periods

Final Evaluation:

A Block: To Be Determined

Unit 1: Electromagnetism

We will begin with electrostatics (the study of electrical forces and charges) to build a base for the topics of electric fields and current. Students will also get hands-on experience building electric circuits. Finally we will look at the connection between electricity and magnetism.

Weeks 1-2:	5 days	Ch. 16: Electric Forces and Fields
Weeks 2-4:	7 days	Ch. 17: Electrical Energy and Current
		Test Week 4
Weeks 4-6:	7 days	Ch. 18: Circuits and Circuit Elements
Weeks 6-7:	4 days	Ch. 19: Magnetism
		Test Week 7

Unit 2: Thermodynamics

We will expand our study of energy and focus on how heat is generated, measured, transferred and the effects that heat has on different materials.

Weeks 7-9	6 days	Ch. 9: Heat
Weeks 9-10	6 days	Ch. 10: Thermodynamics
		Test Week 10

Unit 3: Vibrations and Waves

We will study how energy, in multiple forms, is transmitted through waves. Sound and light will be the major topics covered with glimpses at optics, reflection, refraction, and lenses.

Weeks 10-12	6 days	Ch. 11: Vibrations and Waves
Weeks 12-13	5 days	Ch. 12: Sound
		Test Week 12
Weeks 13-14	5 days	Ch. 13: Light and Reflection
Weeks 14-15	5 days	Ch. 14: Refraction
		Test Week 15

Unit 4: Atomic Physics

We will look at the cutting edge of physics and how we can use what we have learned to push the limit of our understanding of the physical world.

Weeks 16-17	6 days	Ch. 21: Atomic Physics
		Test Week 17
Weeks 17-18	3 days	Research and Presentations